

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. – 102. (cancelled)

103. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by a membrane which is pervious to hydrogen gas and impervious to liquids and solids and comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces an interior of the fuel cell.

104. (new) The fuel cell of claim 103, wherein the membrane comprises a porous membrane which comprises a hydrophobic material.

105. (new) The fuel cell of claim 104, wherein the membrane comprises pores having diameters which are not smaller than about 0.05  $\mu\text{m}$ .

106. (new) The fuel cell of claim 105, wherein the membrane has a thickness of from about 50  $\mu\text{m}$  to about 300  $\mu\text{m}$ .

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107. (new) The fuel cell of claim 104, wherein the hydrophobic material comprises a fluorine containing polymer.

108. (new) The fuel cell of claim 107, wherein the fluorine containing polymer comprises a fluorine containing polyolefin.

109. (new) The fuel cell of claim 108, wherein the hydrophobic material comprises polytetrafluoroethylene.

110. (new) The fuel cell of claim 107, wherein the membrane further comprises activated carbon.

111. (new) The fuel cell of claim 110, wherein the activated carbon is at least one of dispersed in and bonded by the fluorine containing polymer.

112. (new) The fuel cell of claim 107, wherein the coating provides a surface energy which is lower than a surface energy provided by the membrane.

113. (new) The fuel cell of claim 104, wherein the coating provides a surface energy of not higher than about 12 dynes/cm.

114. (new) The fuel cell of claim 103, wherein the coating provides a surface energy of not

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higher than about 8 dynes/cm.

115. (new) The fuel cell of claim 112, wherein the coating comprises a polymer with repeating units which comprise a fluorinated aliphatic group having at least about 5 fluorine atoms.

116. (new) The fuel cell of claim 115, wherein the fluorinated aliphatic group comprises a fluoroalkyl group having from about 4 to about 20 carbon atoms.

117. (new) The fuel cell of claim 116, wherein the fluorinated aliphatic group comprises a perfluoroalkyl group having from about 6 to about 10 carbon atoms.

118. (new) The fuel cell of claim 115, wherein the fluorinated aliphatic group comprises a perfluorooctyl group.

119. (new) The fuel cell of claim 115, wherein the polymer comprises repeating units of perfluorooctyl methacrylate.

120. (new) The fuel cell of claim 103, wherein the membrane comprises a porous membrane which consists essentially of an inorganic material.

121. (new) The fuel cell of claim 120, wherein the inorganic material comprises at least one of

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glass, ceramic, metal, alumina and zeolite.

122. (new) The fuel cell of claim 121, wherein the membrane comprises pores having diameters of from about 0.1  $\mu\text{m}$  to about 5  $\mu\text{m}$ .

123. (new) The fuel cell of claim 122, wherein the membrane has a thickness of from about 20  $\mu\text{m}$  to about 1 mm.

124. (new) The fuel cell of claim 120, wherein the porous membrane comprises a borosilicate material.

125. (new) The fuel cell of claim 120, wherein the porous membrane comprises stainless steel.

126. (new) The fuel cell of claim 120, wherein the coating comprises fluorinated aliphatic groups having at least about 5 fluorine atoms.

127. (new) The fuel cell of claim 126, wherein the fluorinated aliphatic groups comprise fluoroalkyl groups having from about 4 to about 20 carbon atoms.

128. (new) The fuel cell of claim 127, wherein the fluorinated aliphatic groups comprise perfluoroalkyl groups having from about 6 to about 10 carbon atoms.

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129. (new) The fuel cell of claim 120, wherein the fluorinated aliphatic groups comprise a perfluorooctyl group.

130. (new) The fuel cell of claim 120, wherein the coating comprises repeating units of one or more hydrolyzable silanes which have at least one fluorinated aliphatic group directly bonded to a silicon atom, the fluorinated aliphatic group comprising from about 6 to about 10 carbon atoms and at least about 5 fluorine atoms.

131. (new) The fuel cell of claim 130, wherein the one or more hydrolyzable silanes comprise at least one trialkoxyperfluoroalkylsilane.

132. (new) The fuel cell of claim 131, wherein the at least one trialkoxyperfluoroalkylsilane comprises at least one of trimethoxyperfluorooctylsilane and triethoxyperfluoro-octylsilane.

133. (new) The fuel cell of claim 103, wherein the membrane is a non-porous membrane.

134. (new) The fuel cell of claim 133, wherein the membrane comprises at least one of a silicone rubber and PTFE-treated activated carbon.

135. (new) The fuel cell of claim 134, wherein the membrane comprises from about 90 % to about 50 % by weight of activated carbon and from about 50 % to about 10 % by weight of PTFE.

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136. (new) The fuel cell of claim 133, wherein the membrane has a thickness of from about 20  $\mu\text{m}$  to about 1000  $\mu\text{m}$ .

137. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by a porous membrane which is pervious to hydrogen gas and impervious to liquids and solids and comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces an interior of the fuel cell, the coating providing a surface energy of not higher than about 12 dynes/cm.

138. (new) The fuel cell of claim 137, wherein the coating provides a surface energy of not higher than about 10 dynes/cm.

139. (new) The fuel cell of claim 137, wherein the coating provides a surface energy of not higher than about 8 dynes/cm.

140. (new) The fuel cell of claim 137, wherein the membrane comprises polytetrafluoroethylene.

141. (new) The fuel cell of claim 140, wherein the coating provides a surface energy of not higher than about 10 dynes/cm.

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142. (new) The fuel cell of claim 140, wherein the coating comprises a polymer with repeating units which comprise a fluorinated aliphatic group having at least about 5 fluorine atoms.

143. (new) The fuel cell of claim 142, wherein the fluorinated aliphatic group comprises a fluoroalkyl group having from about 4 to about 20 carbon atoms.

144. (new) The fuel cell of claim 143, wherein the fluorinated aliphatic group comprises a perfluorooctyl group.

145. (new) The fuel cell of claim 144, wherein the polymer comprises repeating units of perfluorooctyl methacrylate.

146. (new) The fuel cell of claim 137, wherein the membrane consists essentially of an inorganic material.

147. (new) The fuel cell of claim 146, wherein the inorganic material comprises at least one of glass, ceramic, metal, alumina and zeolite.

148. (new) The fuel cell of claim 146, wherein the membrane comprises a borosilicate material.

149. (new) The fuel cell of claim 148, wherein the membrane consists essentially of stainless

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steel.

150. (new) The fuel cell of claim 146, wherein the coating comprises fluorinated aliphatic groups having at least about 5 fluorine atoms.

151. (new) The fuel cell of claim 150, wherein the fluorinated aliphatic groups comprise fluoroalkyl groups having from about 4 to about 20 carbon atoms.

152. (new) The fuel cell of claim 151, wherein the fluorinated aliphatic groups comprise a perfluorooctyl group.

153. (new) The fuel cell of claim 146, wherein the coating comprises repeating units of one or more hydrolyzable silanes which have at least one fluorinated aliphatic group directly bonded to a silicon atom, the fluorinated aliphatic group comprising from about 6 to about 10 carbon atoms and at least about 5 fluorine atoms.

154. (new) The fuel cell of claim 153, wherein the one or more hydrolyzable silanes comprise at least one trialkoxyperfluoroalkylsilane.

155. (new) The fuel cell of claim 154, wherein the at least one trialkoxyperfluoroalkylsilane comprises at least one of trimethoxyperfluorooctylsilane and triethoxyperfluoro-octylsilane.



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156. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by a membrane unit that is impervious to liquid and solid components of a hydride-based fuel and comprises at least one membrane which is impervious to liquid and pervious to hydrogen and, on at least a side of the at least one membrane which faces an interior of the fuel cell, a protective element which protects the at least one membrane from at least one of a physical and a chemical attack by the fuel and its decomposition and reaction products.

157. (new) The fuel cell of claim 156, wherein the protective element comprises a porous gas-pervious membrane which is more resistant to at least one of a physical and a chemical attack by the fuel and its decomposition and reaction products than the at least one membrane.

158. (new) The fuel cell of claim 157, wherein the protective element comprises a porous membrane which comprises activated carbon.

159. (new) The fuel cell of claim 158, wherein the porous membrane further comprises a fluorine containing polymer.

160. (new) The fuel cell of claim 159, wherein the activated carbon is at least one of dispersed in

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and bonded by the fluorine containing polymer.

161. (new) The fuel cell of claim 160, wherein the fluorine containing polymer comprises polytetrafluoroethylene.

162. (new) The fuel cell of claim 156 wherein the protective element comprises a structure with sufficiently small openings to substantially prevent a physical attack of the at least one membrane by fuel-derived liquid and solid particles of high kinetic energy.

163. (new) The fuel cell of claim 162 wherein the openings comprise holes having a diameter of not more than about 5 mm.

164. (new) The fuel cell of claim 156, wherein the protective element comprises a structure with skewed slots.

165. (new) The fuel cell of claim 156, wherein the protective element comprises a foam element which comprises pores having diameters which are large enough to allow liquid to pass through the foam element.

166. (new) The fuel cell of claim 165, wherein the foam element comprises pores having diameters of from about 0.3 mm to about 5 mm.

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167. (new) The fuel cell of claim 165, wherein the foam element has a thickness of from about 1 mm to about 5 mm.

168. (new) The fuel cell of claim 167, wherein the foam element comprises polytetrafluoroethylene.

169. (new) The fuel cell of claim 156, wherein the protective element comprises at least one of polyurethane, polyethylene, polypropylene, polyvinyl chloride and ABS copolymer.

170. (new) The fuel cell of claim 156, wherein the at least one membrane comprises a reinforced membrane.

171. (new) The fuel cell of claim 170, wherein the reinforced membrane is reinforced by a mesh.

172. (new) The fuel cell of claim 156, wherein the mesh comprises at least one of a metallic material and an organic polymer.

173. (new) The fuel cell of claim 156, wherein the at least one membrane comprises a hydrophobic material.

174. (new) The fuel cell of claim 173, wherein the hydrophobic material comprises a fluorine

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containing polyolefin.

175. (new) The fuel cell of claim 173, wherein the membrane comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces the interior of the fuel cell.

176. (new) The fuel cell of claim 175, wherein the coating comprises a polymer with repeating units which comprise a fluorinated aliphatic group having at least about 5 fluorine atoms and from about 4 to about 20 carbon atoms.

177. (new) The fuel cell of claim 156, wherein the at least one membrane comprises an inorganic material.

178. (new) The fuel cell of claim 177, wherein the inorganic material comprises at least one of glass, ceramic, metal, alumina and zeolite.

179. (new) The fuel cell of claim 177, wherein the membrane comprises a gas-pervious hydrophobic coating on at least a side thereof which faces the interior of the fuel cell.

180. (new) The fuel cell of claim 179, wherein the coating comprises fluorinated aliphatic groups having from about 6 to about 10 carbon atoms.

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181. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by at least one reinforced membrane that is impervious to liquid and solid components of a hydride-based fuel and pervious to hydrogen and comprises a hydrogen-pervious coating on at least a side thereof which faces an interior of the fuel cell, which coating provides a surface energy which is lower than a surface energy of the membrane.

182. (new) The fuel cell of claim 181, wherein the membrane is reinforced by a mesh.

183. (new) The fuel cell of claim 182, wherein the mesh comprises at least one of a metallic material and an organic polymer.

184. (new) The fuel cell of claim 183, wherein the mesh comprises at least one of nickel and stainless steel.

185. (new) The fuel cell of claim 183, wherein the mesh comprises at least one of polytetrafluoroethylene, polypropylene, polyethylene and ABS copolymer.

186. (new) The fuel cell of claim 183, wherein the mesh comprises at least polypropylene.

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187. (new) The fuel cell of claim 181, wherein the at least one membrane comprises a hydrophobic material.

188. (new) The fuel cell of claim 187, wherein the hydrophobic material comprises polytetrafluoroethylene.

189. (new) The fuel cell of claim 188, wherein the coating provides a surface energy of not more than about 12 dynes/cm.

190. (new) The fuel cell of claim 189, wherein the coating comprises a polymer with repeating units which comprise a fluorinated aliphatic group having at least about 5 fluorine atoms and from about 4 to about 20 carbon atoms.

191. (new) The fuel cell of claim 161, wherein the at least one membrane comprises an inorganic material.

192. (new) The fuel cell of claim 191, wherein the inorganic material comprises at least one of glass, ceramic, metal, alumina and zeolite.

193. (new) The fuel cell of claim 191, wherein the coating is hydrophobic and comprises fluorinated aliphatic groups having from about 6 to about 10 carbon atoms on at least a side thereof

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which faces an interior of the fuel cell.

194. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by a membrane unit which comprises at least one first membrane which is pervious to hydrogen gas and impervious to liquids and solids and comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces an interior of the fuel cell, the membrane unit further comprising, on at least a side of the at least one membrane which faces the interior of the fuel cell, a protective element which comprises a at least one second membrane which is porous and gas-pervious and more resistant to at least one of a physical and a chemical attack by the fuel and its decomposition and reaction products than the at least one first porous membrane.

195. (new) The fuel cell of claim 194, wherein the at least one second membrane comprises a fluorine containing polymer and activated carbon which is at least one of dispersed in and bonded by the fluorine containing polymer.

196. (new) The fuel cell of claim 194, wherein the at least one first membrane comprises a reinforced membrane.

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197. (new) The fuel cell of claim 196, wherein the reinforced membrane is reinforced by a mesh.

198. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed inside the fuel cell to escape therefrom, which opening is sealed by a membrane unit which comprises at least one membrane which is pervious to hydrogen gas and impervious to liquids and solids and comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces an interior of the fuel cell, the membrane unit further comprising, on at least a side of the at least one membrane which faces the interior of the fuel cell, a protective element which comprises a structure with sufficiently small openings to substantially prevent a physical attack of the at least one membrane by fuel-derived liquid and solid particles of high kinetic energy.

199. (new) The fuel cell of claim 198, wherein the at least one membrane comprises a reinforced membrane.

200. (new) The fuel cell of claim 196, wherein the reinforced membrane is reinforced by a mesh.

201. (new) A fuel cell for a hydride-based fuel, wherein the fuel cell is suitable for use with a hydride-based fuel and is constructed and arranged to be sealed in a liquid-tight manner when in operation and wherein the fuel cell comprises at least one opening for allowing hydrogen gas formed



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inside the fuel cell to escape therefrom, which opening is sealed by a membrane unit which comprises at least one membrane which is pervious to hydrogen gas and impervious to liquids and solids and comprises a hydrogen-pervious hydrophobic coating on at least a side thereof which faces an interior of the fuel cell, the membrane unit further comprising, on at least a side of the at least one membrane which faces the interior of the fuel cell, a protective element which comprises a foam element which comprises pores having diameters which are large enough to allow liquid to pass through the foam element.

202. (new) The fuel cell of claim 201, wherein the foam element comprises pores having diameters of from about 0.3 mm to about 5 mm.

203. (new) The fuel cell of claim 201, wherein the at least one membrane comprises a reinforced membrane.

204. (new) The fuel cell of claim 203, wherein the reinforced membrane is reinforced by a mesh.